INSURANCE INFORMATION INSTITUTE

Energy Infrastructure and Vulnerabilities

Insurance Market Perspectives

U.S. Department of Energy

Quadrennial Energy Review Public Meeting

Washington, DC

April 11, 2014

Download at www.iii.org/presentations

Robert P. Hartwig, Ph.D., CPCU, President & Economist

Insurance Information Institute ♦ 110 William Street ♦ New York, NY 10038

Tel: 212.346.5520 ♦ Cell: 917.453.1885 ♦ bobh@iii.org ♦ www.iii.org

INSURANCE INFORMATION INSTITUTE

Energy Is a Very Large and Very Challenging Business for Insurers Worldwide

Energy is One of the Few Major Markets/Industries With Clear Long-Term Growth Trends

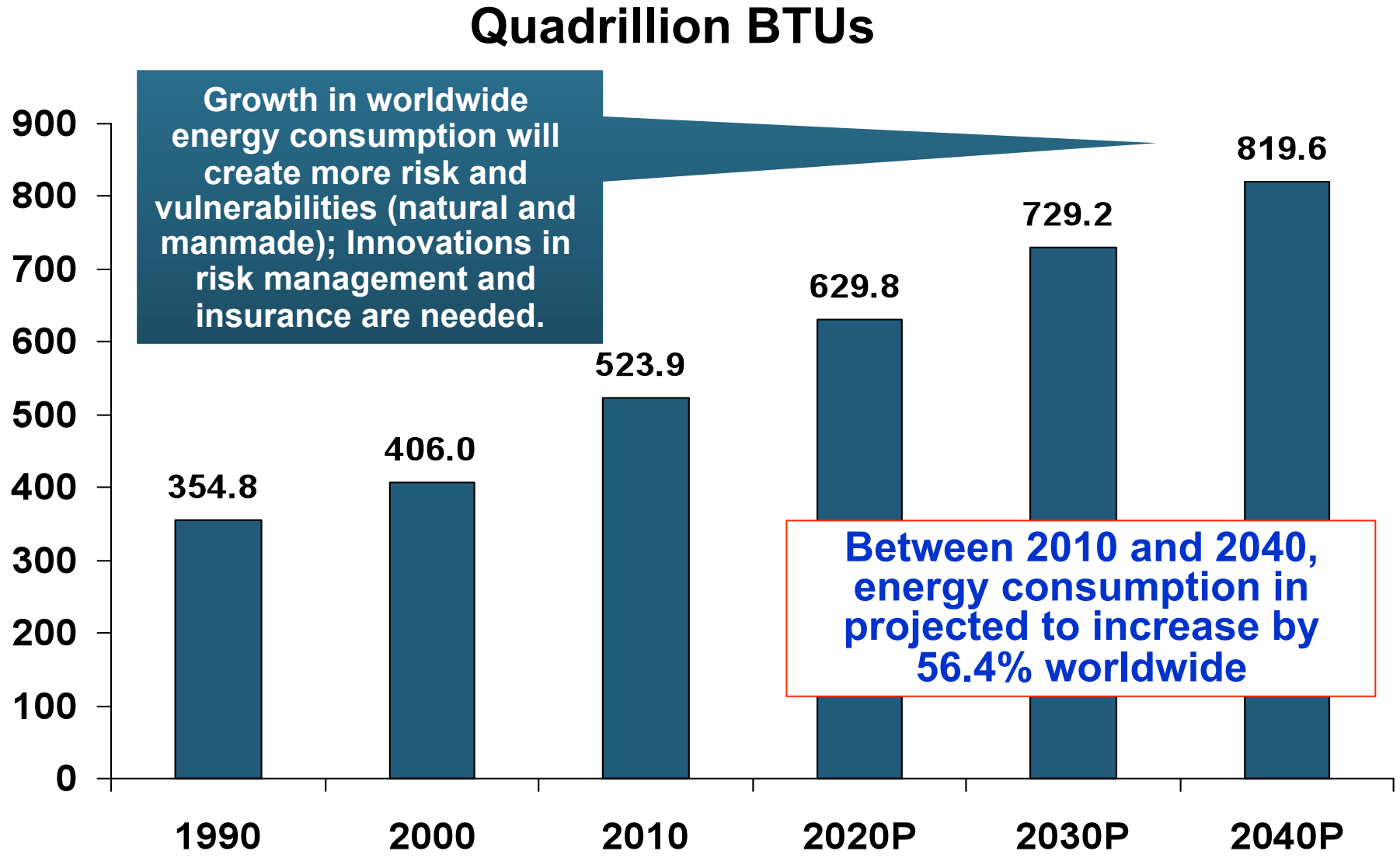
Energy Insurance Market Summary

- **Energy is Among the Insurance Industry's Largest Industry Sectors**
- **Insurers Have Extensive Experience Offering Comprehensive Solutions Across the Entire Spectrum of Energy Industry Property and Liability Exposures**
  - **Extraction (on/offshore)**
  - **Refining and Storage**
  - **Transportation (marine, rail, truck)**
  - **Generation (Electricity)**
  - **Renewables**
  - **Workers Compensation**
  - **Management Liability (D&O)**

Energy Insurance: Market Summary (cont'd)

- **Multi-Billion Dollar Limits Are Available in Most Segments**
  - Property and liability exposures
  - Risks are rewarded for superior experience
- **Results Can Be Volatile**
- **Insurers Work Closely With Client Risk Managers**
- **Price of Coverage is Both Event Driven and Cyclical**
- **Market is Truly Global**
  - Substantial share of underwriting capacity originates abroad
- **History of Working Closely to Reduce Loss, Enhance Resilience**
  - Major losses stimulate innovative risk management
  - Price (premium/rate) is a powerful signal about risk; Motivates

World Primary Energy Consumption, 1990-2040P

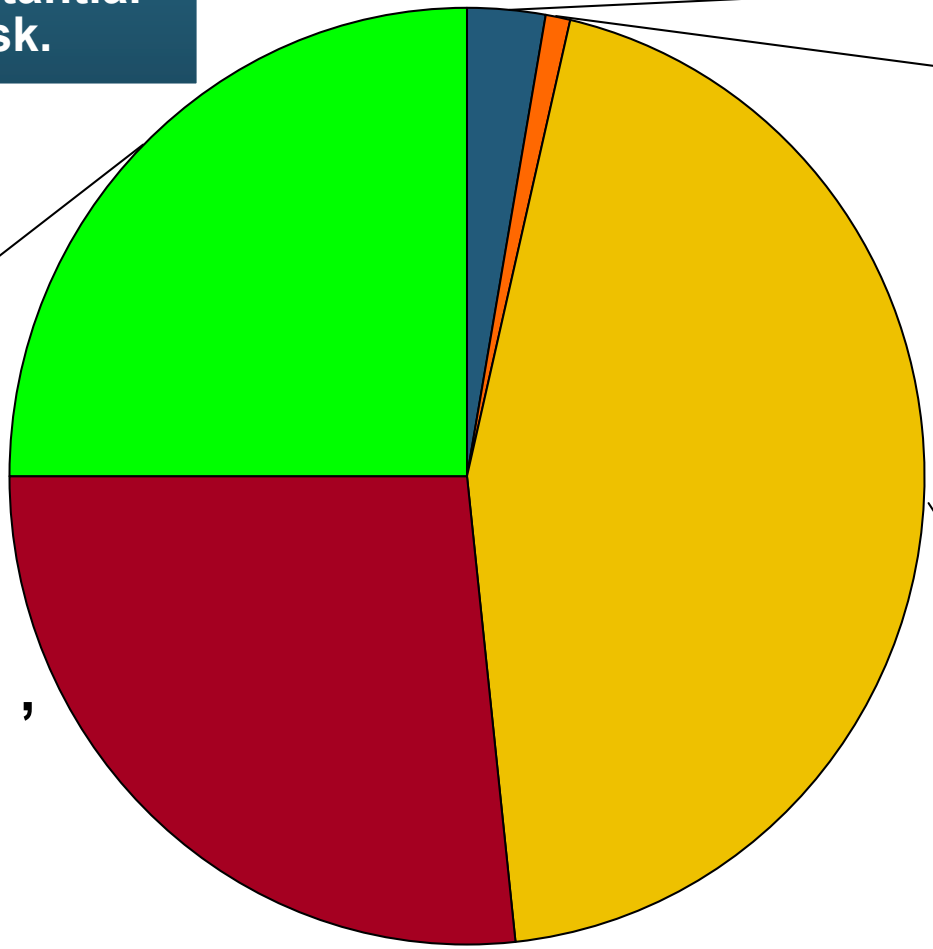


Source: Energy Information Administration, *2013 International Energy Outlook*, Insurance Information Institute.

Cumulative Projected Investment in Global Energy Infrastructure, 2011-2035 ($ Trill.)

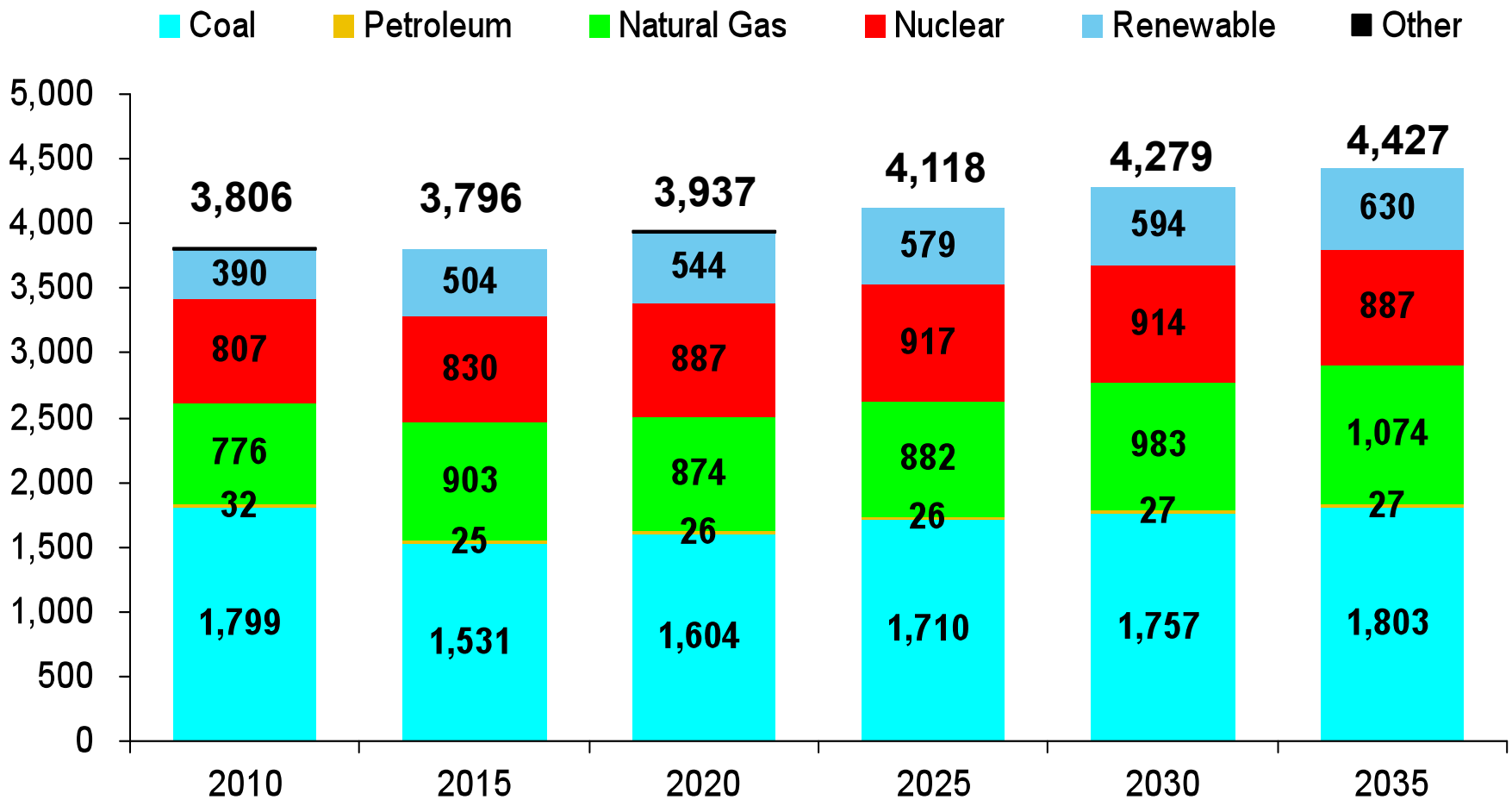
INSURANCE INFORMATION INSTITUTE

Projected energy infrastructure investment through 2035 total $38 trillion; Implies substantial incurrence of risk.



Source: International Energy Agency, *World Energy Outlook 2011.*

US Electric Power Generation by Fuel Source, 2010-2035F (Billions of Kilowatt Hours)



Demand for Electricity Is Expected to Grow at a 0.6% Annual Rate Through 2035. Renewables and Natural Gas Will Account for an Increasing Share of Fuel Source

Source: US Energy Information Administration, *Annual Energy Outlook 2012,* Appendix A7.

The Past Few Years Have Not Been Kind to Insurers *or* Utilities

Hurricane Irene: Aug. 27-29, 2011

Insured Losses: $4.3 Billion

Customers w/o Power: 5 Million

"Snowtober" Blizzard: Oct. 29, 2011

Insured Losses: ~$1 Billion

Customers w/o Power: 2.7 Million

Derecho: June 29, 2012

Insured Losses: ~ $1+ Billion

Customers w/o Power: 3.7 Million

Superstorm Sandy: Oct. 29-30, 2012

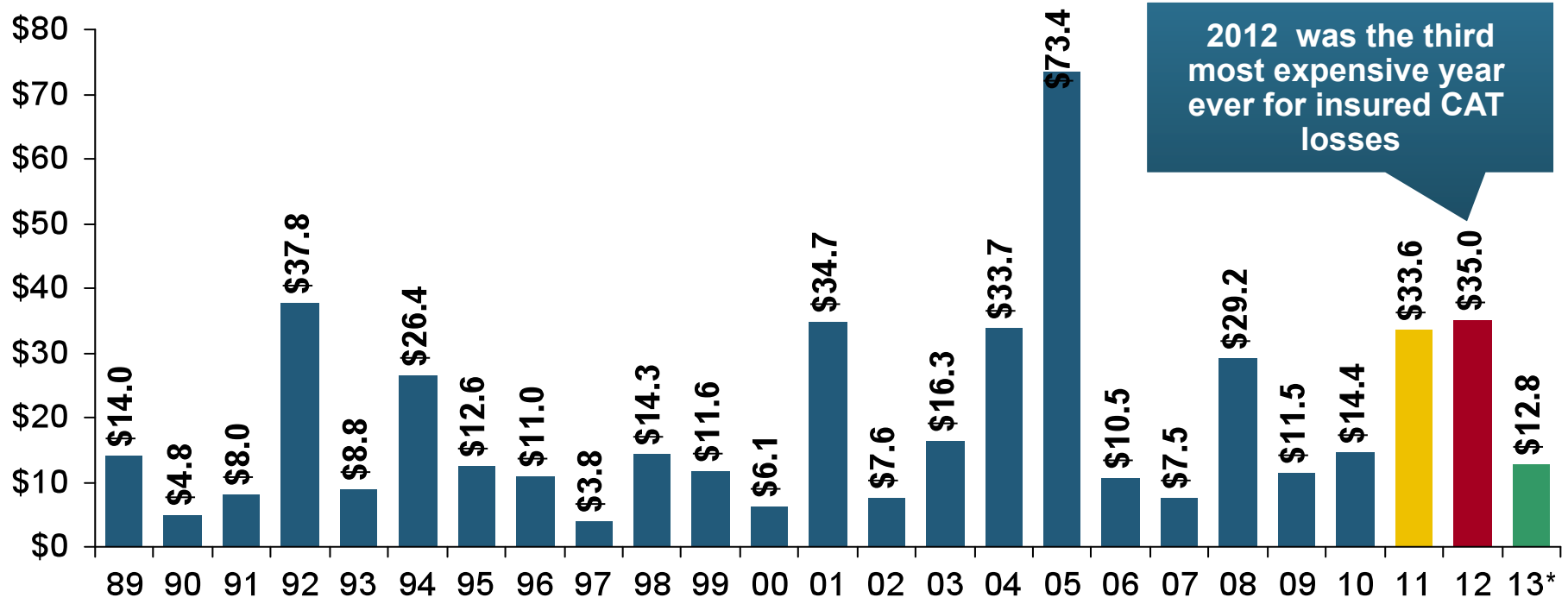
Insured Losses: $18.8 Billion
Customers w/o Power: 8.1 Million

Source: Insurance Information Institute research.

U.S. Insured Catastrophe Losses

INSURANCE INFORMATION INSTITUTE

($ Billions, $ 2012)



2012 Was the 3rd Highest Year on Record for Insured Losses in U.S. History on an Inflation-Adj. Basis. 2011 Losses Were the 6th Highest. YTD 2013 Running Well Below 2011 and 2012 YTD Totals.

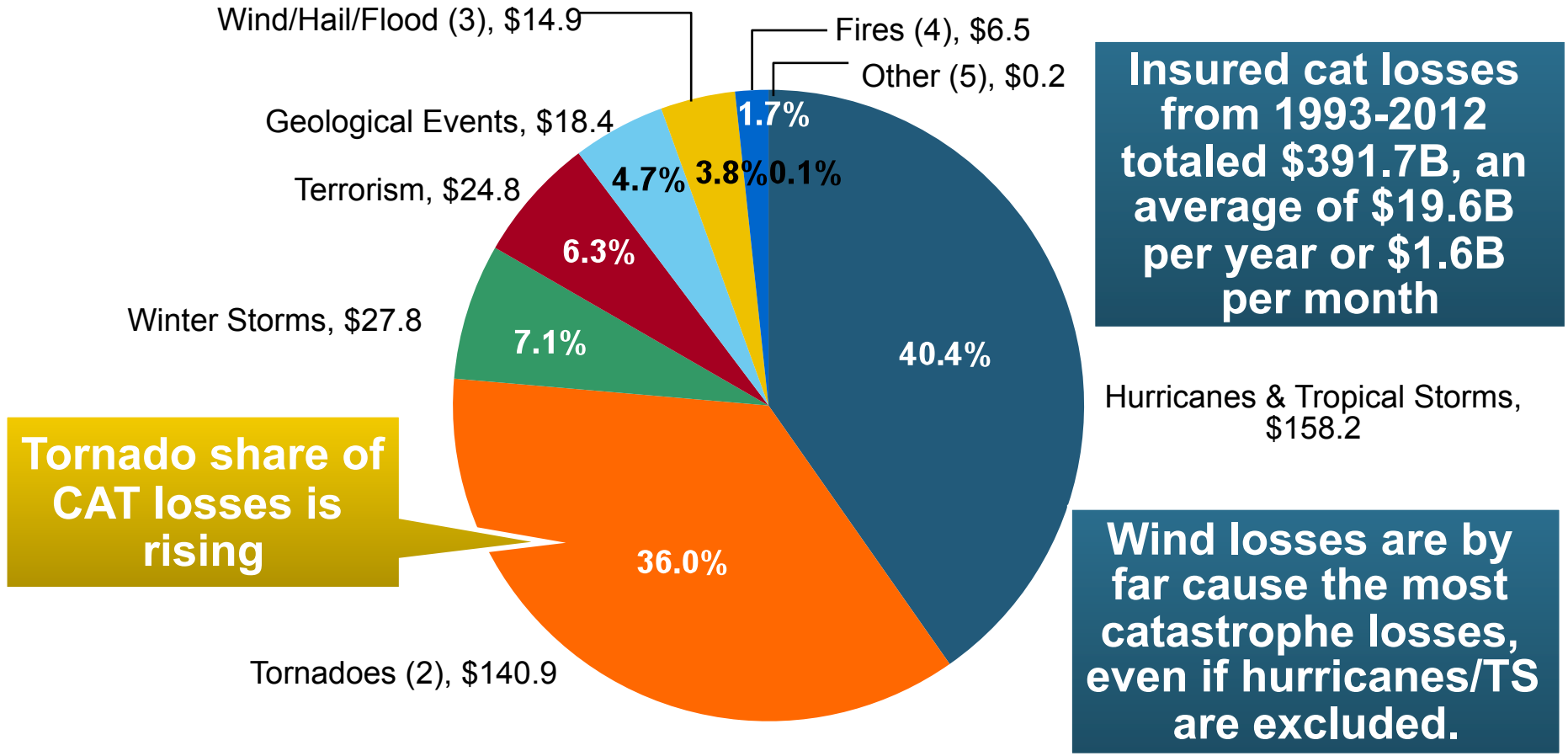
Record tornado losses caused 2011 CAT losses to surge

*Through 12/31/13.

Note: 2001 figure includes $20.3B for 9/11 losses reported through 12/31/01 ($25.9B 2011 dollars). Includes only business and personal property claims, business interruption and auto claims. Non-prop/BI losses = $12.2B ($15.6B in 2011 dollars.)

Sources: Property Claims Service/ISO; Insurance Information Institute.

Inflation Adjusted U.S. Catastrophe Losses by Cause of Loss, 1993–2012[1]



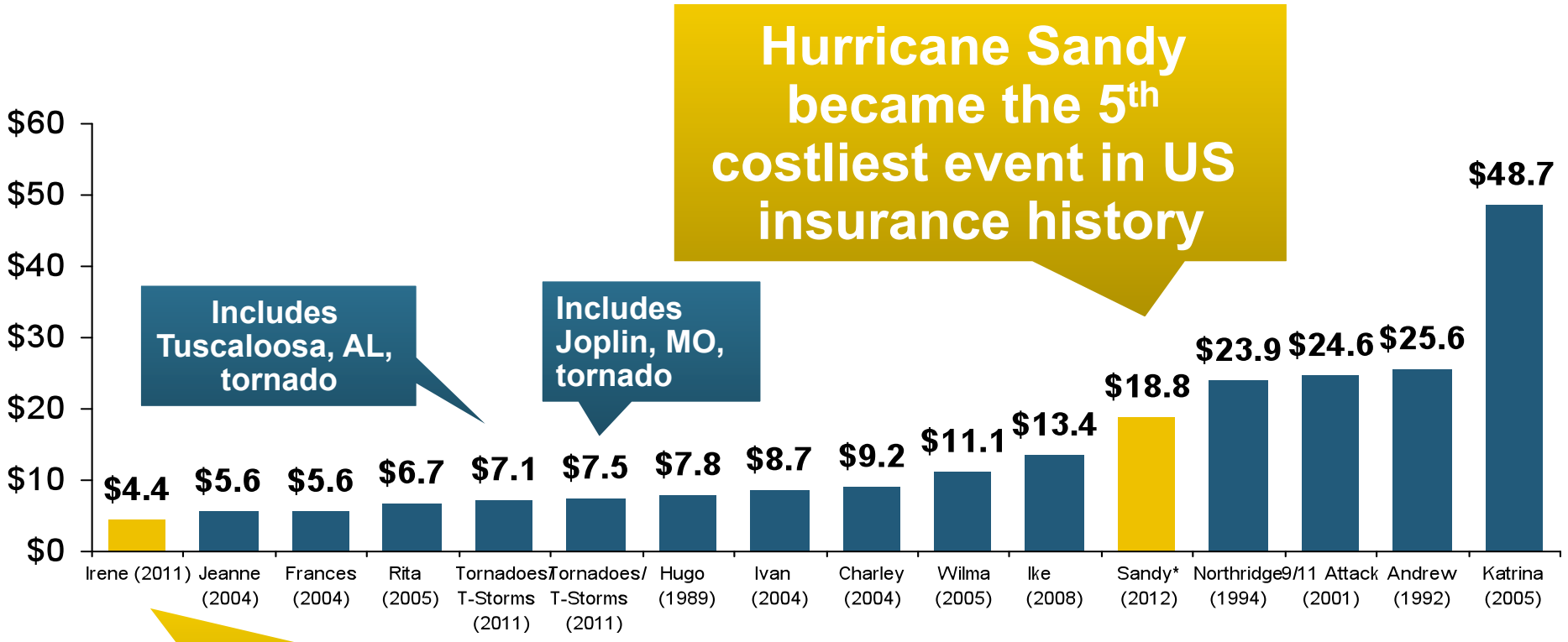
1. Catastrophes are defined as events causing direct insured losses to property of $25 million or more in 2012 dollars.
2. Excludes snow.
3. Does not include NFIP flood losses
4. Includes wildland fires
5. Includes civil disorders, water damage, utility disruptions and non-property losses such as those covered by workers compensation.

Source: ISO's Property Claim Services Unit.

Top 16 Most Costly Disasters in U.S. History

INSURANCE INFORMATION INSTITUTE

(Insured Losses, 2012 Dollars, $ Billions)



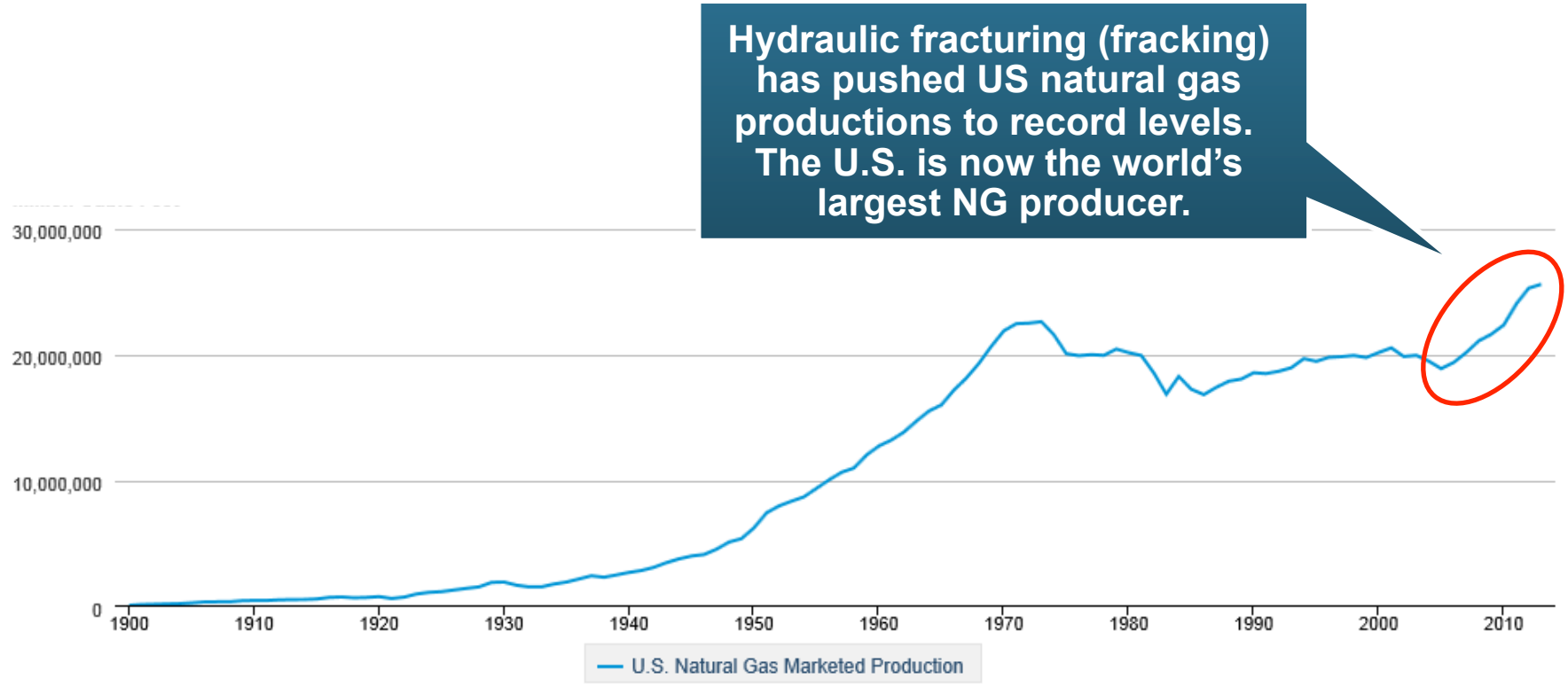
*PCS estimate as of 4/12/13.

Sources: PCS; Insurance Information Institute inflation adjustments to 2012 dollars using the CPI.

U.S. Natural Gas Marketed Production, 1900 - 2013

INSURANCE INFORMATION INSTITUTE

Million Cubic Feet



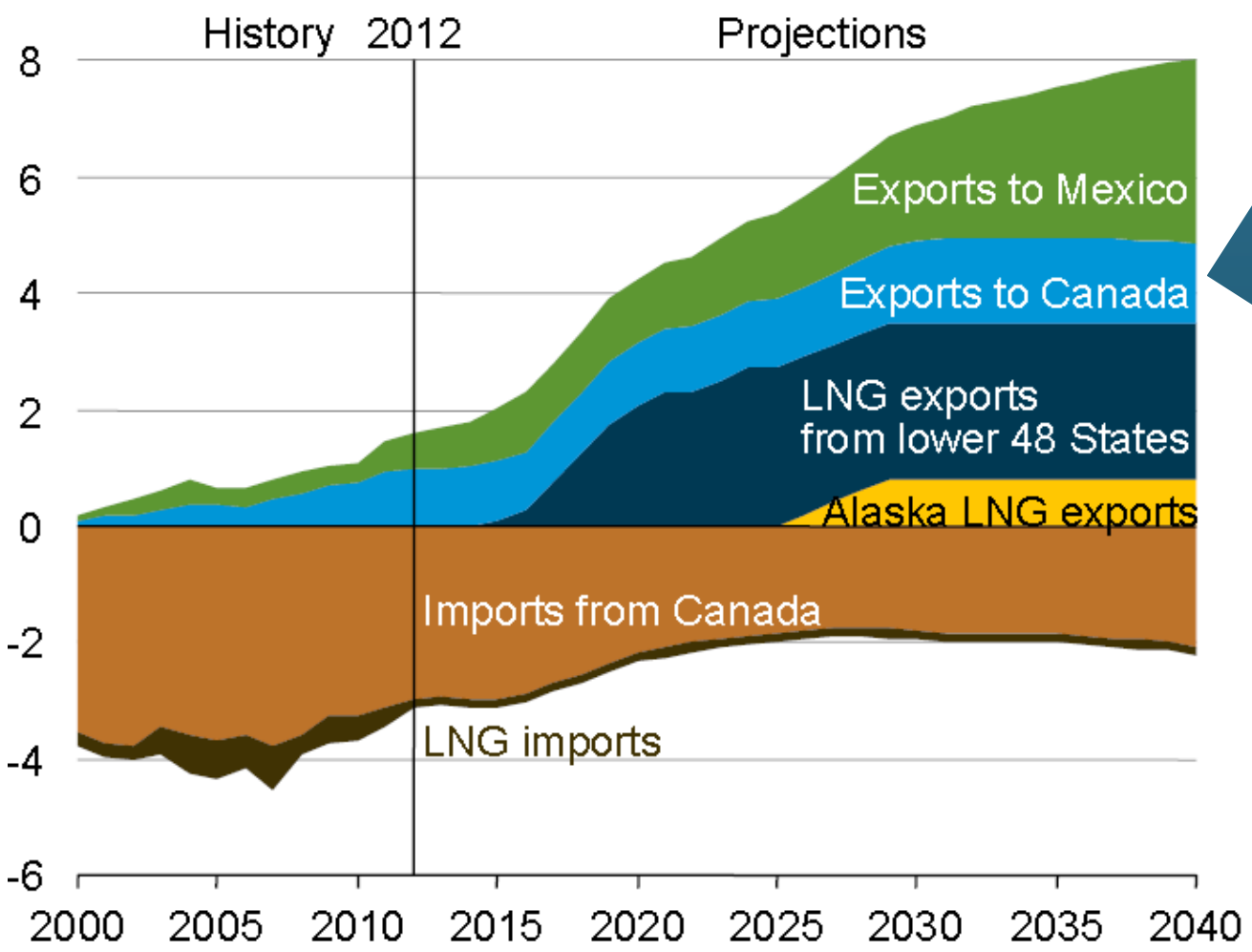
eia Source: U.S. Energy Information Administration

Source: U.S. Energy Information Administration, accessed 4/10/14 at http://www.eia.gov/dnav/ng/hist/n9050us2a.htm

U.S. Natural Has Imports and Exports, 1990 - 2040

INSURANCE INFORMATION INSTITUTE

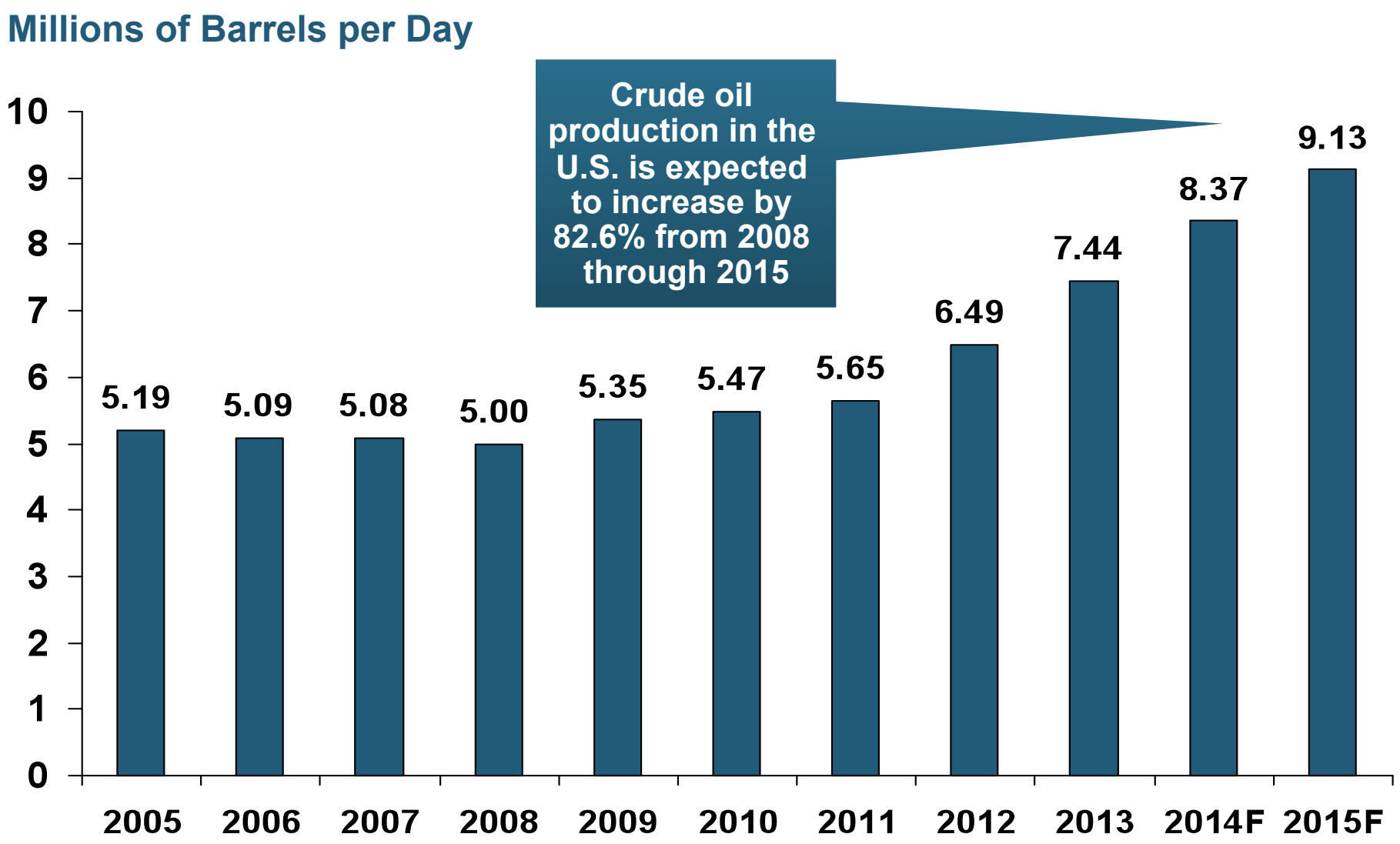
Trillions of Cubic Feet



The US is now the largest gas producer in the world, though Russia is the largest exporter. The US needs to invest in its pipeline and LNG infrastructure and expedite regulatory approval to realize its full export potential

Sources: US Energy Information Administration, *Annual Energy Outlook 2014 Early Release Overview;* ;Insurance Information Institute.

U.S. Crude Oil Production, 2005-2015P



Source: Energy Information Administration, *Short-Term Energy Outlook* (April 8, 2014) , Insurance Information Institute.

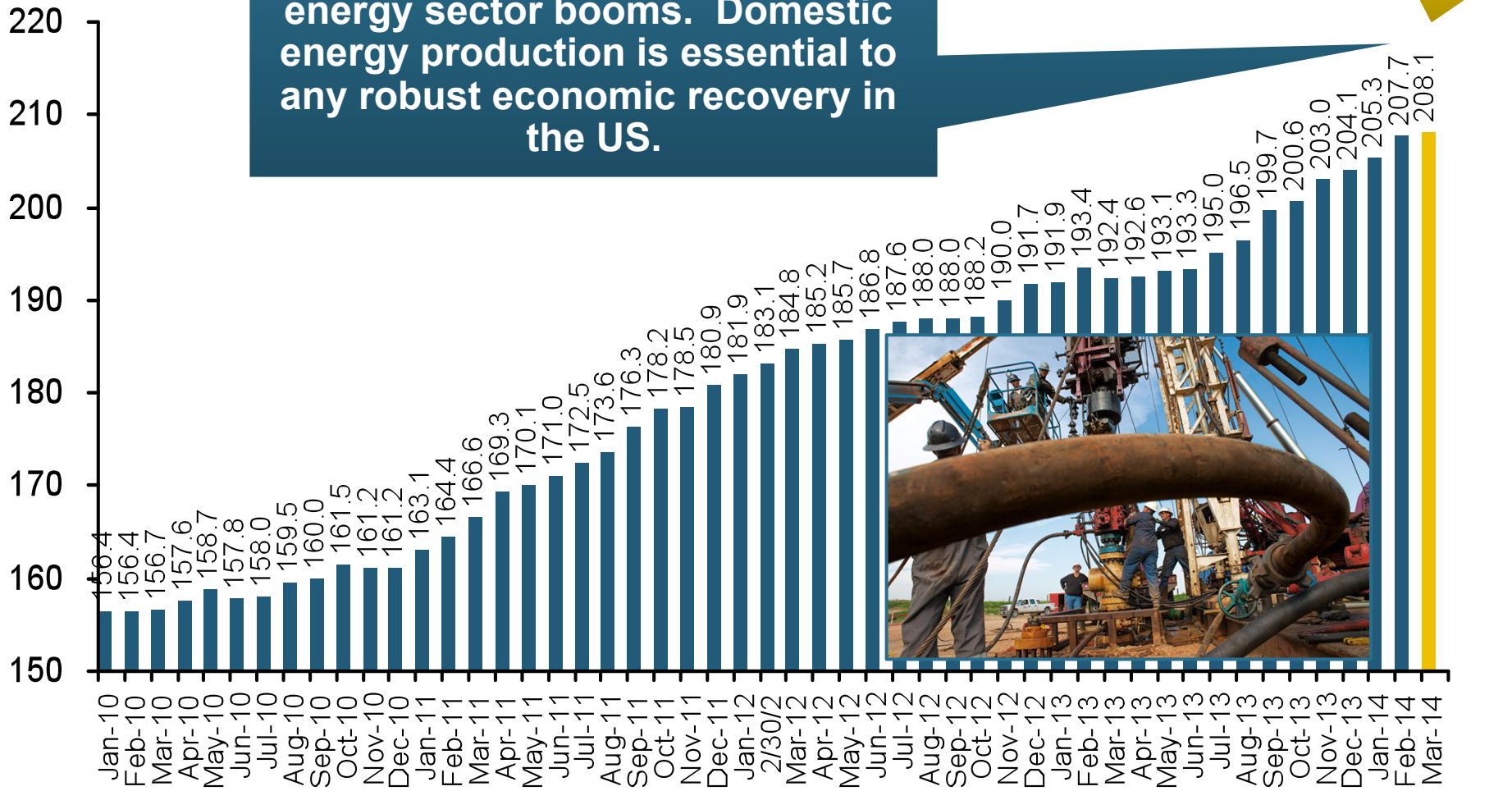
Oil & Gas Extraction Employment, Jan. 2010—March 2014*

INSURANCE INFORMATION INSTITUTE

(Thousands)

Oil and gas extraction employment is up 33.1% since Jan. 2010 as the energy sector booms. Domestic energy production is essential to any robust economic recovery in the US.

Highest since Aug. 1986



*Seasonally adjusted

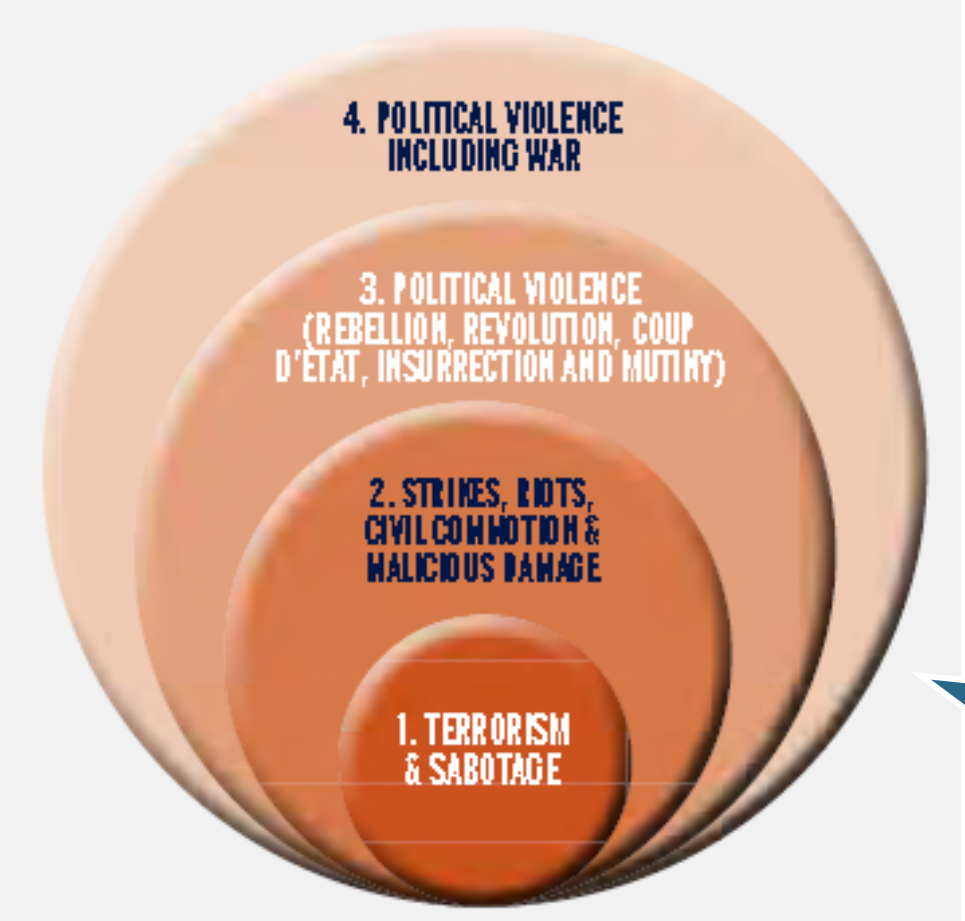
Sources: US Bureau of Labor Statistics at http://data.bls.gov; Insurance Information Institute.

Insurance Industry Concerns Related to Energy Infrastructure

- **Grid Vulnerability to Physical (Terrorist) Attack**
  - April 2013 attack on PG&E substation in Metcalf, CA
  - Question of public disclosure of such events per DOE IG report
  - Expiration of Terrorism Risk Insurance Act 12/31/14
- **Pipeline Risks**
  - Pollution/Environmental risks
- **Offshore**
  - Remains a concern post-Deepwater Horizon
  - Vulnerable to manmade and natural disaster risks
- **Arctic Pollution**
  - New frontier
- **Rail Transportation**
  - Concerns in the wake of several major, costly explosions
- **Cyber**
  - "Data" policies available (protects value of digital assets)
  - Management liability coverage (D&O) increasingly available
  - Broad property and liability is not commonly available

Source: Insurance Information Institute research and *Willis 2014 Energy Market Review*.

The Spectrum of Political Violence Including Terrorism



DISTURBING FACTS

- In the US, 40% of all cyber attacks on critical infrastructure assets in 2012 occurred against the energy sector
- Globally, it's estimated that cyber attacks against oil and gas infrastructure will cost oil and gas companies $1.87 billion by 2018
- The UK govt. estimates that oil and gas companies in the UK already lose ~GBP400 million per year as a result of cyber attacks

Sources: ICS-CERT; ABI; KPMG

The view is that eventually terrorism risk could be managed within the spectrum of Political Violence risks, which are a constant concern in the global energy sector

Sources: 2014 *Willis Energy Review*, p.25.

INSURANCE INFORMATION INSTITUTE

Insurance Information Institute Online:

www.iii.org

Thank you for your time and your attention!

Twitter: twitter.com/bob_hartwig

Download at www.iii.org/presentations